

ABSTRACT

In a first aspect, an apparatus is provided for detecting substrates. The apparatus includes (1) a transmitter/receiver unit adapted to transmit a light beam through a substrate located within a transfer chamber; (2) a reflector adapted to receive the light beam transmitted from the transmitter/receiver unit and to reflect the transmitted light beam toward the transmitter/receiver unit; and (3) a controller coupled to the transmitter/receiver unit and adapted to determine whether a substrate is positioned between the transmitter/receiver unit and the reflector based on an intensity of the reflected light beam received by the transmitter/receiver unit. At least one of the transmitted and reflected light beams is adapted to strike a substrate positioned between the transmitter/receiver unit and the reflector with non-normal incidence. Numerous other aspects are provided.